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10/16/2009

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EXAMINER

VU, DAVID

ART UNIT

PAPER NUMBER

2818

NOTIFICATION DATE

DELIVERY MODE

10/16/2009

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentmail@whda.com

|                              |                                      |  |  |
|------------------------------|--------------------------------------|--|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/823,729 | <b>Applicant(s)</b><br>WATANABE ET AL. |  |
|                              | <b>Examiner</b><br>DAVID VU          | <b>Art Unit</b><br>2818                |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 25 June 2009.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-4, 12, 13, 28, 29 and 34-36 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 12, 13, 28, 29 and 34-36 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01/14/04 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### **Claim Rejections - 35 USC § 112**

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

1. Claims 1-4, 12, 13, 28, 29 and 34-36 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The original disclosure does not include teaching “while only a polishing slurry is supplied onto the polishing pad....”

Applicants submit that support for claims is found in the specification since “nothing is written in an explanation part regarding polishing the surface of the film-to-be-polished to planarize the surface of the film-to-be-polished (page 42, line 4 to page 44, line 17) other than the polishing slurry as a matter supplied onto the polishing pad”. However, the specification as written do not exclude or avoid the use of other element (such as water) in the step of polishing the surface of the film-to-be-polished to planarize the surface of the film-to-be-polished.

Any response to this “new matter” rejection should include the location in the original disclosure where the subject matter can be found.

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***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

2. Claims 1-4, 12, 13, 28, 29 and 34-36 are rejected under 35 U.S.C. 103 (a) as being unpatentable over by Zagrebelny (US Pat. 6,863,595) in view of Miyashita et al. (US Pat. 5,861,054; hereinafter Miyashita).

**A) Regarding claims 1, 3, 12 and 28,** Zagrebelny discloses in Abstract and figs. 6-8 a semiconductor device fabrication method comprising the steps of: polishing a surface of a film-to-be-polished formed over a semiconductor substrate 140 with a polishing pad while only a polishing slurry is supplied onto the polishing pad to thereby planarize the surface of the film-to-be-polished (primary polishing step; col. 11, lines 62-67); and after the surface of the film-to-be-polished has been planarized (fig. 7), further polishing the surface of the film-to-be-polished with the polishing pad while polishing slurry and water are supplied onto the polishing pad (final

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polishing step with residual slurry particles 158 present on surface 156; fig. 7 and col. 14, lines 33-50), polishing slurry and water being supplied onto the polishing pad separately (Abstract and col. 14, lines 52-55); wherein polishing slurry comprises abrasive grains and a surfactant additive (col. 8, lines 2-16).

Zagrebelny fails to disclose the polishing slurry is supplied onto the polishing pad through a nozzle, and water is supplied onto the polishing pad through another nozzle. However, Miyashita teaches the further polishing the surface of the film-to-be-polished 6 (figs. 3F-3I), in which polishing slurry is supplied onto the polishing pad through a nozzle (nozzle 39 in fig. 9). , and water is supplied onto the polishing pad through another nozzle (nozzle 40 in fig. 9). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Zagrebelny by using a polishing system as taught by Miyashita, in order to control the pH of a polishing solution on the topography (col. 11, lines 61 through col. 12, line 8).

**Regarding claim 35**, Zagrebelny discloses the polishing pad used in the further polishing the surface of the film-to-be-polished (final polishing pad) is different from the polishing pad used in the polishing the surface of the film-to-be-polished to planarize the surface of the film-to-be-polished (primary polishing pad) (col. 16, lines 35-38).

**B) Regarding claims 2, 13 and 29**, Zagrebelny discloses in Abstract and figs. 6-8 a semiconductor device fabrication method comprising the steps of: polishing a surface of a film-to-be-polished formed over a semiconductor substrate 140 with a polishing pad while only a

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polishing slurry is supplied onto the polishing pad to thereby planarize the surface of the film-to-be-polished (primary polishing step; col. 11, lines 62-67); and after the surface of the film-to-be-polished has been planarized (fig. 7), further polishing the surface of the film-to-be-polished with the polishing pad while polishing slurry and water are supplied onto the polishing pad (final polishing step with residual slurry particles 158 present on surface 156; fig. 7 and col. 14, lines 33-50), polishing slurry and water being supplied onto the polishing pad separately (Abstract and col. 14, lines 52-55); wherein polishing slurry comprises abrasive grains and a surfactant additive (col. 8, lines 2-16); and wherein a water content in mixture of polishing slurry and water of the final polishing step (col. 14, lines 33-50) is higher than a water content in polishing slurry of the primary polishing step (primary polishing step without water; col. 11, lines 62-67 and Abstract).

Zagrebelny fails to disclose the polishing slurry is supplied onto the polishing pad through a nozzle, and water is supplied onto the polishing pad through another nozzle. However, Miyashita teaches the further polishing the surface of the film-to-be-polished 6 (figs. 3F-3I), in which polishing slurry is supplied onto the polishing pad through a nozzle (nozzle 39 in fig. 9), and water is supplied onto the polishing pad through another nozzle (nozzle 40 in fig. 9).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Zagrebelny by using a polishing system as taught by Miyashita, in order to control the pH of a polishing solution on the topography (col. 11, lines 61 through col. 12, line 8).

**Regarding claim 36**, Zagrebelny discloses the polishing pad used in the further polishing the surface of the film-to-be-polished (final polishing pad) is different from the polishing pad

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used in the polishing the surface of the film-to-be-polished to planarize the surface of the film-to-be-polished (primary polishing pad) (col. 16, lines 35-38).

**C) Regarding claims 4 and 34,** Zagrebelny Zagrebelny discloses in Abstract and figs. 6-8 a semiconductor device fabrication method comprising the steps of: polishing a surface of a film-to-be-polished formed over a semiconductor substrate 140 with a polishing pad while only a polishing slurry is supplied onto the polishing pad to thereby planarize the surface of the film-to-be-polished (primary polishing step; col. 11, lines 62-67); and after the surface of the film-to-be-polished has been planarized (fig. 7), further polishing the surface of the film-to-be-polished with the polishing pad while polishing slurry and water are supplied onto the polishing pad (final polishing step with residual slurry particles 158 present on surface 156; fig. 7 and col. 14, lines 33-50), polishing slurry and water being supplied onto the polishing pad separately (Abstract and col. 14, lines 52-55); wherein polishing slurry comprises abrasive grains and a surfactant additive (col. 8, lines 2-16)

Zagrebelny fails to disclose the supply amount of the water is 2 or more times as much as a supply amount of the polishing slurry (claim 4); or the ratio of a supply amount of the second polishing material of the polishing slurry to a supply amount of the water is 1:5 (claim 34). Although the exact ratio of polishing slurry:water was not specified as recited in claims 4 and 34, it appears that the ratio as claimed is prima facie obvious due to the fact that one can vary the amount of polishing slurry and water to achieve a specific stable compound. This claim is prima facie obvious without showing that the claimed ranges achieve unexpected results relative to the prior art range. In re Woodruff, 16 USPQ2d 1935, 1937 (Fed. Cir. 1990). See also

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In re Huang, 40 USPQ2d 1685, 1688 (Fed. Cir. 1996) (claimed ranges of a result effective variable, which do not overlap the prior art ranges, are unpatentable unless they produce a new and unexpected result which is different in kind and not merely in degree from the results of the prior art). See also In re Boesch, 205 USPQ 215 (CCPA) (discovery of optimum value of result effective variable in known process is ordinarily within skill of art) and In re Aller, 105 USPQ 233 (CCPA 1955) (selection of optimum ranges within prior art general conditions is obvious).

Zagrebelny also fails to disclose the polishing slurry is supplied onto the polishing pad through a nozzle, and water is supplied onto the polishing pad through another nozzle. However, Miyashita teaches the further polishing the surface of the film-to-be-polished 6 (figs.3F-3I), in which polishing slurry is supplied onto the polishing pad through a nozzle (nozzle 39 in fig. 9). , and water is supplied onto the polishing pad through another nozzle (nozzle 40 in fig. 9). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Zagrebelny by using a polishing system as taught by Miyashita, in order to control the pH of a polishing solution on the topography (col. 11, lines 61 through col. 12, line 8).

### **Response to Arguments**

3. Applicant's arguments with respect to claims 1-4, 12, 13, 28, 29 and 34-36 have been considered but are moot in view of the new ground(s) of rejection.



***Conclusion***

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Vu whose telephone number is (571) 272-1798. The examiner can normally be reached on Monday-Friday from 8:00am to 5:00pm. If attempt to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Loke H can be reached on (571) 272-1657. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR, Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

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system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/DAVID VU/  
Primary Examiner, Art Unit 2818